



KUMA STOVES, INC.
HAYDEN, ID. USA

MODEL:
SHASTA
Fuel-oil stove

User Manual for:
-Installation
-Operation
-Servicing

This manual contains information necessary for the safe installation and operation of your Kuma model Shasta either in residential or mobile homes. While most anyone can install their oil stove, it is highly recommended that the installation be done by a qualified installer familiar with fuel oil stoves and the essentials of draft, preferably an NFI Certified (National Fireplace Institute) expert. We recommend contacting local building or fire officials in your area regarding restrictions and installation inspection requirements. Please read this entire manual before attempting installation or operation of this appliance. Improper installation or operation of this oil stove can result in bodily or property damage.

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SECTION 1

Stove placement, air requirements, and clearances

Try to pick a location that will be somewhat central in the house or room in which you wish to install the Shasta. Due consideration of the fuel tank location, ease of fuel line installation, and flue location is wise. You will want to read the fuel tank section to get a better idea of where to locate the tank as well as the stove. The stove must be placed on hearth that is non-combustible, having a thickness of 3/8" or greater. A 24"x30" minimum hearth pad area is recommended. Once a location is established, the stove can be placed on the hearth and leveled. It is absolutely imperative that your stove is level. There are adjustment bolts under each corner of the pedestal base should these adjustments be necessary, or if a leg set is used, there are adjustment bolts on each leg. Place a level on top of the pedestal base both directions and adjust until level.

This unit has been tested to U.L. 896 and 307A by Omni Test Laboratories and is approved for installation and use in manufactured homes. There are some special considerations when installing into a mobile or manufactured home. The flue system must consist of a 4" diameter CLASS "L", U.L. 641 type insulated chimney, and either a 4" single or double-wall stove pipe connector. A CLASS "A" metal chimney or a masonry chimney may be used, but must have a 4" stainless steel liner. Dura-Vent Pellet Vent (4") may be used as either a connector or chimney or both. The manufactured home installation also requires an outside combustion air source. If outside air is accessed through the floor, a 4" diameter or larger duct should be installed through the hearth and floor, extending past the insulation barrier on the underneath side of the home. Make sure there is a rodent screen with a maximum 1/4" x 1/4" opening placed over the duct opening to prevent rodents from accessing the stove bottom. A standard outside air (dryer-vent type) kit may be used or an outside air kit (#4OAVK) may be obtained from your dealer.

The air duct does not need to connect directly to the stove as the duct may terminate at the hearth top level. If air is accessed through the wall, remove the air cover at the stove pedestal back, and install a 4" or larger duct connecting the stove pedestal and the wall. A storm or dryer type vent with a screen is adequate, or a Kuma #4OAVK kit which includes all parts necessary to access air through the wall or floor is available from your dealer. If you are not installing this stove in a mobile home, and outside air is not desired, simply remove the outside air cover at the pedestal back so ambient room air can enter.

Please note that at certain draft conditions (i.e. high winds) a significant amount of air may be needed to achieve a proper burn. Consideration of open windows or an air source near the stove will probably be necessary depending on the "air-tightness" of your home. Again, outside air to your oil stove is a good idea as it will make the combustion impervious to house pressure problems. For further help or questions, contact your dealer.

*Please note that these clearances are minimums. It is a good idea to exceed these clearances unless space is limited. Common sense must prevail.

Minimum Clearances to Combustibles

	<u>Sides</u>	<u>Back</u>	<u>Flue Pipe</u>	<u>Corner</u>	<u>Top</u>
Standard	10"	1"*	3"***	3"	—
Alcove	10"	1"*	3"	3"	18"

Note: Corner clearance applies only when the stove is installed in a room corner with the stove placed perpendicular to the corner (45 degrees).

*Note: On alcove installations, the maximum depth of the alcove is 30".
Minimum alcove width is 42".*

**1" Clearance from stove back to wall on through-wall installations only. When passing through the wall, Class "L" or Class "A" chimney must be used along with proper approved wall thimble. NEVER USE SINGLE WALL PIPE TO PASS THROUGH A COMBUSTIBLE WALL.*

***Clearances to flue pipe are for single-wall connectors. A double-wall connector is required for mobile home installations.*

SECTION 2

The flue and flue connections

Do not connect this unit to a flue servicing another appliance. It is of utmost importance that the flue be dedicated to the Shasta as the flue is, without a doubt, the most important component of the system. Good combustion is dependent upon the correct amount of air being supplied to the burner at all times, which is dependent upon a correct negative flue pressure.

Draft is caused by the gases inside the flue being hotter and lighter than the air outside, thus the rising heated gases carry out the products of combustion. Since the flue “sucks” gases up the flue, it is this suction that draws air into the pedestal area to feed the burn pot with the air needed for an efficient, blue-flame burn. This will depend on the flue’s ability to provide a consistent negative pressure. There is no substitute for a warm, efficient chimney/pipe system. If the flue gases cool too quickly, draft will slow and combustion will not be as efficient. *Do not skimp on the flue system.* A good rule of thumb on chimney height is a minimum of 12’ from the stove top to termination. Location of chimney and other factors may require more or less chimney height.

An insulated chimney is a must in order to maintain the heat inside the chimney for proper flow of gases. Use a Class “L”, 4” diameter, insulated chimney that has been tested to U.L. 641 when passing through combustibles, or use 4” or 5” diameter Class “A” insulated HT type chimney. Due consideration must be given to your particular climate zone. Extreme cold ‘attacks’ the chimney’s ability to maintain an efficient draft. The stove pipe connector may be single-wall black pipe with tight fitting joints (mobile home connectors must be double-wall). Make sure that all joints are securely fastened with three sheet metal screws, including the connection at the stove as well as at the ceiling or chimney connection. The Shasta may also be connected to a masonry chimney, but it is recommended that it be lined with a 4” stainless steel liner and insulated as well. Use and install all piping according to the manufacturers listed clearances.

Certain atmospheric conditions such as high winds will cause a change (increase or decrease) in the negative pressure inside the flue and thus inside the stove. To compensate for this, your stove has a draft or flue stabilizer which is a barometric damper located at the rear back of your stove. Under certain geographic or atmospheric conditions, it may be necessary to install a wind-beater vacuum cap or a wind-directional cap. See your dealer for information. Upon installation of the stove and after lighting and warm-up, the rear cover must be removed and the draft stabilizer adjusted. Its purpose is to allow more or less air to travel into the flue to compensate for a change in the flue draft. Adjustment of the draft stabilizer will be discussed in Section 4.

SECTION 3

Fuel tank installation and fuel line connections

OIL:

Your Kuma model Shasta comes with a carburetor set for an average of a 2.35 cc. viscosity rating. You should be able to burn either #1 or #2 fuel with adjustments to the carburetor. Bio-diesel may also be successfully burned in the Oil Classic. Due consideration to fuel grades should be noted. #1 Fuel oil, K-1, or kerosene will burn much cleaner than #2 fuel and requires less maintenance. #2 fuel or diesel grades of fuel are fine to burn, however there are combustibles present in # 2 fuel that become solids when they are burned, thereby requiring more frequent cleaning of the decoker and burner.

TANK:

The fuel tank should be clean (second-hand tanks not recommended), so a new tank is advised. Steel tanks require more maintenance such as painting to prevent rust. A polyethylene tank is preferred as it will never rot or rust, and is basically maintenance-free. A tank with a larger capacity will require less fillings as well as an opportunity to obtain better pricing for fuel oil in greater quantities. Avoid placing the tank in direct sunlight. Warm tanks will condense moisture which will fall to the bottom of your tank where it will need to be drained to prevent valve damage and/or freezing and stopping oil flow. Also, due consideration should be given to accessibility to the tank for delivery trucks.

The ideal tank should have two bottom-end outlets: one for fuel supply to the stove, and one to drain off any water and dirt. To be able to do this, the tank must be installed with a “fall” of at least 1/4” per foot of tank length. The fuel supply will come from the high end of the tank and the lower end will be used for draining condensation and impurities. If the tank has only one outlet, be sure to tip the tank away from the outlet slightly, as described above. Brick or cement foundation for the tank is advised.

To provide correct pressure of the fuel supply to your stove, the tank outlet should be between 16" and 72" above the carburetor on the stove. Be sure the support system under the tank is safe and adequate as a full 300 gallon tank will weigh about 2000 lb.

If you must install a tank below the stove, or above the recommended height, a lift pump and/or a level control valve may be needed. You will need to check local building codes regarding such installations.

CONNECTIONS:

There should be 2 valves on a typical installation: 1) a shut-off valve at the tank to allow service to any piping or changing the main filter, and 2) a shut-off valve close to the stove to be able to isolate the stove for any maintenance, and if required by code, a fire valve right before the fuel pipe enters the building which would automatically shut off the oil supply in the unlikely event of the stove overheating. Piping to the stove from the tank may be either steel or copper, but copper is preferred to prevent any rusting problems. When making the fuel line connection with the copper line from the tank to the stove, it is best to have a gradual slope or "fall" on the line (i.e. no dips or kinks) so as to prevent any air bubbles or collection of dirt or other impurities. A 3/8" diameter copper supply line is recommended and either compression type or flare type fitting may be used. Finally, a good quality filter should be placed at the tank to ensure a good, clean supply of oil to your stove. The carburetor on the stove is equipped with a screen-type filter but it is not intended for use as the primary filter.

SECTION 4

Lighting, carburetor adjustments, and draft stabilizer adjustments

PRE-LIGHTING CHECKS:

The installation should be inspected to ensure that the work is complete and the workmanship is satisfactory. No stove should be lit if any part of the installation does not comply with the relevant standards and regulations.

The oil tank should be examined to confirm there is a supply of the correct grade of oil, that a filter and a working isolation valve are fitted. Having verified that the oil pipe work up to the stove is complete and that the fire valve (if used) is closed, the tank isolation valve should be opened and the pipe work inspected for leaks. The pipe into the inlet of the carburetor should be uncoupled, the fire valve (if used) opened and a minimum of one quart of oil collected into a suitable receptacle. If dirt or water is present in this sample, additional oil should be allowed through the pipe work until it is free from contaminants. The fuel pipe work should be reassembled and all connections checked for leaks and tightened as necessary.

Top burn ring: Laying on top of the catalyst inside your Shasta stove is a stainless steel top burn ring. It is important that the ring be in the proper position. It comes in the proper position from the factory. Should the height of this ring change, it is easy to re-adjust by bending the three tabs that rest on the catalyst top up or down. Locate the two continuous rows of air holes circling the burner top. The top ring tabs should set on the catalyst top so that the outer edge of the ring comes out right between those two rows of air holes. It is also very important that the "cupped" part of the ring itself is facing up. The stove will not burn properly if the ring is face down.

LIGHTING:

Initial lighting should be undertaken by a qualified technician, with a suitable probe-type manometer for checking the flue pressure. Although adjusting the draft stabilizer by “feel” is possible, the most efficient method of tuning the stove is at the start and with the proper equipment. The customer who will be operating the stove is an important partner in this process, so a full understanding of how the stove operates is invaluable.

Shortly after the stove is lit an air pressure reading should be taken. To take this reading, drill a hole suitable for the manometer probe size in the stove pipe directly above the stove outlet. After pressure readings are finished, simply plug the stove pipe hole with a suitable sized screw.

Lighting the stove:

1. Remove top ring from burner top.
2. Remove the catalyst (stainless steel mesh cylinder) from the burn pot.
3. Turn all supply valves on.
4. Turn control knob on carburetor to setting 1.
5. Press on/off control lever on carburetor to start (it pulls up and clicks to shut stove off and pushes or clicks down to on position).
6. When a small amount of oil is visible in the burner bottom, take a wooden kitchen match and light the oil (a small piece of crumpled tissue paper can be lit and tossed into the burner if desired, or use an alcohol-gel fire starter).
7. When oil is lit, replace the catalyst and the top ring and shut the door (slightly cracked door is helpful for a short period of time to aid initial light-up of oil, but should not be required for more than 30 or so seconds). Please note: during initial start-up, before the catalyst begins vaporizing the fuel, a very active yellow flame will appear. This is a normal burning off of excess fuel flooding the burner before vaporization begins.
8. Within a few minutes, the stove burner should begin burning blue at flame base and yellow at flame tip. At this point a pressure check should be made, and the draft stabilizer adjusted to within the recommended pressure setting range.
9. Run the stove for at least 30 minutes on low or medium to allow the whole stove and chimney to come up to operation temperature. At this point adjustments to the carburetor for correct high and low-fire should be done. See the following section for adjustment procedure.
10. Turn the control knob to setting 1 and run for about 10-15 minutes and check the pressure once again.

CARBURETOR ADJUSTMENTS:

Your Shasta has a carburetor that has both low-fire (setting 1) and high-fire (setting 6) adjustment screws on the top. They are small slotted screws that are of red color and may need to be adjusted for correct flame size.

Both low- and high-fire settings have been pre-set at the factory, but depending on your choice of fuel (#1 or #2 grade), these will usually need to be adjusted for the viscosity of fuel you are using. Please note that after initial warm-up it is important to adjust the high-fire first, then the low-fire, as any adjustment made to the high-fire can affect the low-fire, but not vice versa. Below is a description of what the flame should look like at both low- and high-fire:

Low-fire:

The flame should be totally blue with blue flame “spears” or jets dancing between the inner wall of the burn pot and the catalyst. The catalyst will be dull red to bright red. There will be blue flame appearing around the fire ring at the catalyst top. You can decrease the setting to where there is only the blue spears in the burn pot and little activity of blue flame at the burner top. However, if there is very much yellow flame in the burn pot on low setting, then the low-fire adjustment screw needs to be increased to a total blue flame condition.

High-fire:

The flame should be bright yellow with a full fire-box height to where the flame will begin to break up and terminate 2"-3" below the baffle at stove top. The base of the flame at the burner ring should still be blue, going to white/yellow up to tip of flame, and the catalyst will be a dull red. If the flame is too high and allowed to impinge on the baffle, the result will be a cooling of the flame tip, and incomplete combustion, thereby producing smoke and soot. Adjust the high-fire adjustment screw to achieve proper flame size.

***EACH ADJUSTMENT OF NO MORE THAN ONE-QUARTER TURN SHOULD BE ALLOWED TO STABILIZE FOR FIVE MINUTES BEFORE MAKING ANY FURTHER ADJUSTMENTS ON EITHER HIGH- OR LOW-FIRE.**

***MAKE SURE THE FLUE PRESSURE IS CORRECT BEFORE MAKING ANY CARBURETOR ADJUSTMENTS.**

The carburetor on your Shasta has a main float valve internally to regulate the oil level in the stove. It also has a separate, second safety float that can trip off if the oil level becomes too high in the carburetor. Should this occur, you can reset the safety lever by clicking it back down to start. You may need to reset the lever several times before the level of oil in the carburetor returns to a normal level. Your Shasta has been rigorously tested to both U.L. 896 and U.L. 307A for both residential and mobile homes, and should the fire snuff out for any reason, the carburetor will not allow more than 3/4" of oil in the bottom of the burner.

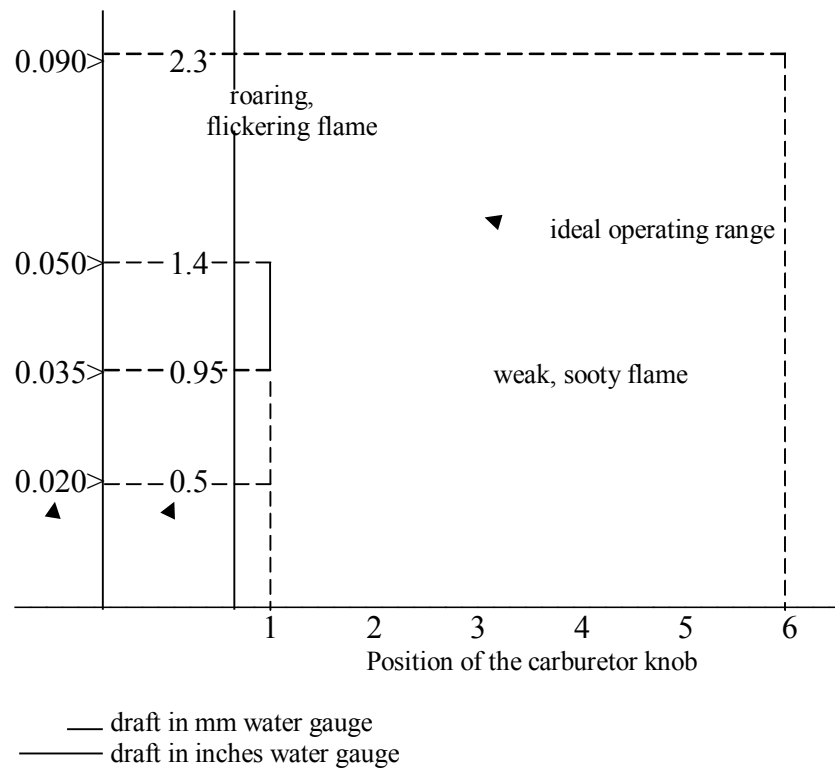
*If you are experiencing excessive yellow, sooty flame on either high or low, you could be building up excessive, fuel-rich gases inside your stove. **These gases can be explosive.** If this condition exists, shut down the stove and contact your dealer about proper adjustment of the carburetor and/or draft problems.*

Should the fire go out for any reason, **NEVER ATTEMPT TO LIGHT A HOT STOVE!** Try to determine why the stove went out and then allow the stove time to cool for 30 minutes before re-starting following the lighting instructions in this manual.

DRAFT STABILIZER ADJUSTMENTS:

After removing the rear draft stabilizer access cover at stove back, you will see that the draft stabilizer has a weighted adjustment screw that you will be able to adjust to weigh more or less on the stabilizer shutter to allow more or less air into the flue. With a suitable manometer, probe into the flue, adjust the weighted screw to where the pressure reading falls within the satisfactory operating range shown on the chart on the following page. If the flame or draft is too high (not enough air entering the draft stabilizer) the fire can flicker excessively and make a roaring noise. If too much air is entering the draft stabilizer, the flame will be weak and smoky, producing soot on the glass. If the flame will be taller and more yellow/orange in color. This indicates a low negative pressure and inefficient draft. If a manometer is not available, set the stabilizer while on high burn to the point where the stabilizer shutter is just closed with little movement needed to push it open or closed. When your Shasta is burning on low burn, the draft stabilizer should be closed, but should wind or any other condition attempt to increase the draft, the draft stabilizer should be able to flutter open, thereby adding air to the flue, slowing the draft to a normal draft pressure. Setting pressure with a manometer is highly recommended. Should the flue be subjected to prolonged high winds or the flue itself is of high efficiency, the draft stabilizer may not be able to supply enough air for an efficient burn. If this condition exists, a second draft regulator in the pipe may be fitted to overcome the excessive draft, or a vacuum cap may be necessary.

Please see chart on following page.



SECTION 5

Servicing

ANNUALLY:

- *Remove catalyst and fire rings and inspect and clean out burn pot of any build-up or debris.
- *Check flue and clean out soot build-up.
- *Clean out stove interior.
- *Lightly brush off catalyst and inspect for deterioration— replace if necessary.
- *Check all gaskets: rope seal around door, window seal (check for loose glass— no need to remove).
- *Check oil tank for damage or leaks and clean or replace main tank filter.
- *Check all lines and connections for leaks or deterioration.
- *A draft reading should be taken for low— and high-fire before operation.

QUARTERLY:

- *Turn stove off and allow to cool.
- *Remove catalyst and clean out any carbon deposits from burner bottom and oil inlet inside burner.

EVERY TWO WEEKS:

*The de-coking rod must be operated at least twice a month to eliminate carbon deposits that build up where oil enters the burner bottom:

1. Open access door on side of stove.
2. Twist and pull de-coking rod out until it stops (angle bend on the end of the rod will be outside the stove body). It may be necessary to use a pair of pliers to move de-coking rod in and out as the packing nut is tight around rod to prevent leakage. *Be careful as packing nut and rod may be hot. Use a glove.*
3. Rotate handle 360 degrees 4 or 5 times and then push handle in until handle is just inside the stove body.
4. Close access door.

**Note: If flame is burning lower than expected, you probably have carbon build-up in the line or burner bottom.*

SECTION 6

Trouble-shooting guide

CONDITION:

1. Oil present in burner with the carburetor in “off” position.
2. No oil in burner bottom after carburetor is turned on.
3. Flame smoky when lit.
4. Flame smoky when burning low.
5. Flame smoky when burning high.
6. Flame goes out on low.
7. Flame goes out in high winds.
8. Burner goes out and will not re-light.
9. Flame is noisy (buzzing or roaring) on high-fire.
10. Flame size seems lower than normal while on high.
11. Dirty or sooty glass.
12. Oil smell in room.

POTENTIAL PROBLEM:

1. -Carburetor had been left on previously without the burner being lit.
2. -Shut-off lever tripped off, and needs to be pressed to start.
 - One of the valves in the oil supply line shut off.
 - No oil in the tank.
 - Carburetor control plate stuck (lightly tap carburetor).
 - Air lock in supply line.
 - Plugged filter (either primary filter or carburetor filter).
 - Condensed water in supply line that has frozen in cold weather.

3. -Stove door not closed tightly.
 - Low draft pressure/draft stabilizer not closing (check pressure).
 - Carbon deposits at oil entry (operate de-coking rod).
 - Cold flue.
 - Plugged flue.
 - Wind conditions causing pressure to be out of limits.
 - Faulty catalyst.
4. -Any problems in (3) above.
 - Dirt, carbon, or residue in burner bottom.
 - Low-fire set too low on carburetor (adjust, see section 4).
5. -Carburetor out of adjustment (decrease high-fire screw).
 - Cold flue.
 - Draft stabilizer needs adjusting (allowing too much air into flue).
 - Flame set too high (flame impinging on baffle too much).
 - Faulty gasket (door rope, glass seal).
 - Excessive residue in burner bottom.
6. -High wind, or unstable draft condition.
 - Incorrect carburetor setting (increase low-fire screw).
 - Flue too cold (increase low-fire screw).
 - Draft stabilizer out of adjustment.
 - Faulty carburetor.
7. -Abnormally high, gusty winds (If you live in a windy area, a second draft stabilizer may need to be installed in the pipe as well to compensate. A wind-directional cap or vacuum cap may also be necessary).
8. -No oil in tank.
 - Valve in fuel supply line shut inadvertently.
 - Fuel supply blocked (plugged filter, frozen water).
 - Carburetor on/off lever tripped.
 - Top burn ring installed incorrectly (see top burn ring location in Section 4).
9. -Stove door having been open for a while and then shut (a roaring noise can occur for a short period until draft stabilizes).
 - Draft stabilizer unable to open enough to compensate with the high draft condition.
(adjust high-fire setting, see section 4)
10. -Carbon deposits (operate de-coking rod).
 - Draft stabilizer stuck closed.
 - Draft pressure too high.
11. -Carburetor adjusted too high, allowing too much flame impingement on stove top.
 - Flue plugged or dirty.
 - Dirty burner or plugged fuel inlet (operate de-coker/clean burner bottom)
 - House pressure problem.
 - Draft stabilizer out of adjustment.
 - Faulty or deteriorated catalyst.
 - Blocked or inhibited air supply to stove (check outside air supply to stove or room).
 - Faulty gasket (door rope, glass seal, or burner gasket).
12. -Oil leaking from any connection.
 - Poorly adjusted burner.

SECTION 7

Fireplace Installation Instructions

Your Shasta Oil Hearth stove can be installed in front of a fireplace, thereby utilizing the fireplace flue. The model Shasta may be vented out the rear and up the fireplace using a 4" stainless steel liner to the chimney top. The model Shasta may be installed in front of all masonry and all factory-built (zero-clearance) fireplaces.

Items needed for a fireplace installation:

1. Model Shasta hearth stove body (no legs).
2. #W-OSSK fireplace surround kit (includes 3 surround panels, 3 gold trim pieces).
3. 4" Stainless steel liner with adequate fittings for connection from the stove flue outlet (4") to chimney top. This liner assembly should include a flashing for finishing off the chimney top, a rain cap, and a storm collar, as well as a connector to the stove. A flex liner kit works well for fireplace applications, allowing unit to be adjusted while out away from the fireplace face.
4. A 5/16" hex socket (driver) to attach panel to back.

You will need to plan for a means to get a 3/8" O.D. minimum copper fuel line into the fireplace from tank source to connect to the carburetor. A flex section of fuel line or a coil of copper tubing behind the unit will be helpful so that the connection can be made while the stove is pulled away from the fireplace face and then pushed back into its final place.

Installation Procedure

Note: All clearances to combustibles listed in this manual must be maintained!

1. Fasten surround panels to unit. There are two side panels (12"x 23 1/2") with slotted holes, and one top panel (8"x 42") with one slotted hole. Loosen the two rear panel screws on the left stove back and attach the left panel using those same screws. Leave screws slightly loose until the top panel is attached.
2. Repeat step 1 for right side panel, leaving screws slightly loose.
3. Loosen top screw at stove back and attach top panel, sliding down on screw slot until the panel rests on the tops of the side panels.
4. Tighten top panel screw.
5. Slide left and right panels left or right until panel top corners are even with the bottom corners of the top panel. Tighten side panel screws.
6. Assemble 3 piece gold trim at corners with a slotted screwdriver (left, right, and top).
7. Slide the gold trim assembly down from the top, the surround panel edge sliding into the 1/8" groove on gold trim back.
8. The unit is now ready to slide back to fireplace opening.
9. Connect flue liner pipe and fuel line to the unit, making sure there are no leaks. As with a free-standing application, all other considerations of the installation for proper operation must be observed, such as levelness of the unit, adequate air supply, draft stabilizer adjustment, etc.
10. Light and operate the unit prior to sliding all the way back onto fireplace front so that adjustment can be made to the draft stabilizer. This will not be possible after the unit is back. Make sure there will be an adequate oxygen supply to the stove. If the existing fireplace has an outside air supply, simply open and leave open.
11. Tune the stove following the carburetor adjustment instructions in this manual.

SECTION 8

Limited Lifetime Warranty

Your Kuma model Shasta is warranted against defects in materials or workmanship according to the following:

*Stove body, all welded steel components– Lifetime, to the original purchaser.

*Burning system (stainless steel burn pot, catalyst, carburetor, fuel line supplied with stove)- 2 years

Warranty does not cover gold plated door surface, normal maintenance items such as paint, glass, and gasket. This warranty does not apply in cases of abuse, mishandling, unauthorized repair, alterations, failures, or operating difficulties due to misuse, accident, misapplication, improper installation, improper maintenance or service. Kuma Stoves reserves the right under this warranty to repair, replace, or authorize repair of the defective stove or part at its discretion. Any warranty concerns should be directed to the authorized dealer, who will contact us.